Journal of Orthopedics Research and Rehabilitation

Case Report

DOI: 10.51271/JORR-0021

A rare case of bilateral septic arthritis: a case report

Mehmet Kurt Bilgehan Ocak Enes Alptekin Canlı Selçuk Yılmaz Nihat Demirhan Demirkıran

Department of Orthopaedics and Traumatology, Faculty of Medicine, Kütahya Health Sciences University, Kütahya, Turkey

Received: 18/10/2023 ◆ **Accepted**: 26/10/2023 ◆ **Published**: 30/10/2023

Corresponding Author: Mehmet Kurt, dr_mehmet91@hotmail.com

ABSTRACT

Acute septic arthritis is an orthopedic emergency that requires rapid diagnosis and treatment to prevent serious complications, morbidity, and mortality. Delayed or inadequate treatment can lead to irreversible joint damage. Risk factors for septic arthritis include previous joint pathologies like rheumatoid arthritis and crystal arthropathy, joint prostheses, low socioeconomic status, and diabetes. Given the increasing frequency of cases of septic arthritis infected with resistant and rare microorganisms, knowing regional epidemiological data is important and necessary for planning treatment approaches. The aim of this article is to present a case of bilateral knee septic arthritis caused by *Bacillus* spp. as a pathogen. The blood parameters and joint fluid culture of the patient led to the diagnosis of bilateral septic arthritis. In the differential diagnosis of a hot and swollen joint, especially in the presence of risk factors, septic arthritis should be considered until ruled out. It should not be forgotten that opportunistic pathogens can also cause septic arthritis.

Keywords: Septic arthritis, opportunistic pathogen, debridment

INTRODUCTION

Septic arthritis should be considered and diagnosed immediately in every patient without a history of trauma who presents with joint pain, swelling and fever. Risk factors for septic arthritis include the patient's age over 80 years, diabetes mellitus, rheumatoid arthritis, recent joint surgery, hip or knee replacement surgery, skin infection, and immunosuppressive drug use.[1] Delay in diagnosis and treatment can cause permanent morbidity and mortality. Physical examination findings and serum markers, including erythrocyte sedimentation rate and C-reactive protein (CRP), are helpful in diagnosis but are nonspecific. Synovial fluid studies are required to confirm the diagnosis.[2] *Staphylococcus aureus* is the most common pathogen isolated in septic arthritis; however, other bacteria, viruses, fungi, and mycobacteria can cause disease. After synovial fluid has been removed, empirical antibiotic therapy should be initiated if there is clinical concern for septic arthritis.[3] Surgical debridement and lavage should be applied in the early period. *Bacillus* spp. may cause endocarditis, meningitis and septicemia, especially in immunocompromised patients.[4] In patients with suppressed immune systems, it should be kept in mind that it is an opportunistic pathogen.[5] In our case, we will present the rare bilateral knee septic arthritis caused by *Bacillus* spp. as a pathogen.

CASE

A 63-year-old male patient was admitted to the emergency room due to redness, swelling and pain in both knees. It was learned that the patient with idiopathic lung fibrosis is on a daily 40 mg of cortisol usage. It was observed that the patient's body temperature, 38.7˚C; respiratory rate, 16/minute; heart rate, 110 beats/minute; the blood pressure, 130/80 mmHg. No acute bone pathology was found in the patient's plane radiological examination (Figure 1). Visual Analogue Scale (VAS) score was evaluated as.[9] It was observed that the patient's blood parameters showed a white blood cell count (WBC) of 10.500/µL and a CRP level of 193 mg/L. Subsequently, it was observed that purulent joint fluid was obtained during the joint aspiration. (Figure 2), and the obtained joint fluid was sent for direct microscobic examination and culture. Empirical antibiotic therapy was initiated for the patient. Emergency surgery was planned for the patient after it was observed that >90% of polymorphonuclear leukocytes (PMNs) were present in the direct microscobical examination sample. In the operating room conditions, debridement and lavage were performed by applying open mini arthrotomy to both knees with a medial parapatellar incision. Cultures from the joint fluid obtained from the

Cite this article: Kurt M, Ocak B, Canlı EA, Yılmaz S, Demirkıran ND. A rare case of bilateral septic arthritis: a case report. *J Orthop Res Rehabil.* 2023;1(4):92-94

This work is licensed under a Creative Commons Attribution 4.0 International License.

patient revealed the growth of *Bacillus* spp. in both knees. The patient was administered antibiotic therapy with cefazolin 4x1 g and ciprofloxacin 2x750 mg. At the first month follow-up, the patient's VAS was found to be two, and it was observed that the patient returned to active life in the first month. At the sixth-week follow-up, the patient, whose CRP was 1.3 mg/L, was discontinued from oral antibiotic therapy. At the third month follow-up, it was observed that the VAS score was 0 and the patient continued his daily life without any restrictions.

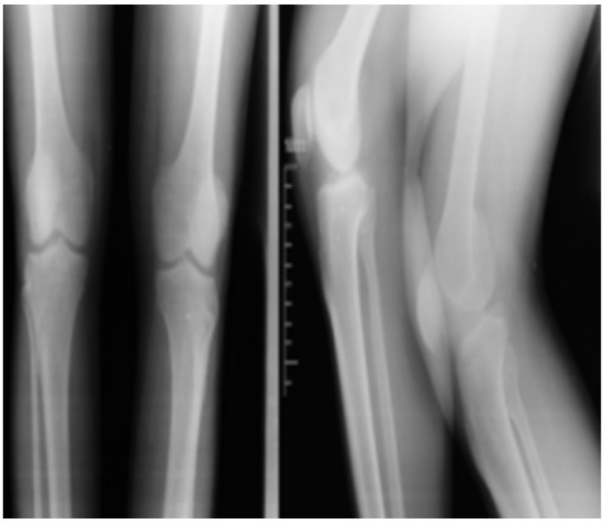

Figure 1. Plane radiological examination

Figure 2. Joint aspiration fluid right and left knee

DISCUSSION

Septic arthritis of the knee joint is an inflammatory condition caused by an infectious source. It primarily affects the synovium and subsequently involves most anatomical structures within joint boundaries.[6] The hip, knee and ankle joints are the most commonly affected areas in the body.[7] The pathogenesis of this condition typically arises through one of three fundamental mechanisms: direct inoculation, contiguous spread, and hematogenous dissemination.[8] The presence of 75% or more leukocytes in the direct microscopic examination of the joint fluid sample is an important finding for septic arthritis.[9] Clinical conditions such as white blood cell count over 11.000/μL, body temperature over 38.5°C, and high CRP are used for the diagnosis of septic arthritis.[10]

It is known that the most common cause of knee septic arthritis in society is *Staphyloccocus aerus*.[11] However, in immunosuppressed patients, such as the use of cortisol, which suppresses the bone marrow, other opportunistic pathogens may cause the disease.[12] *Bacillus* spp. may cause endocarditis, meningitis and septicemia, especially in immunocompromised patients.[4] It is known that septic arthritis causes morbidity by causing cartilage damage due to proteinases produced in the infective process. It is known that septic arthritis leads to morbidity by causing cartilage damage due to proteases that emerge during the infectious process. Therefore, in patients with suspected septic arthritis, urgent surgical debridement and lavage should be performed.[13] The patient's comorbidities, especially factors that suppress the immune system such as rheumatoid arthritis, diabetes or immunomodulatory therapy, are important. In the case of a second focus of infection, chronic kidney disease, or advanced age, patients are at risk of worse outcomes.[14] Bilateral knee septic arthritis is extremely rare.[15] In our case, it was considered that the elderly male patient living in a rural area had become immunosuppressed due to long-term cortisone use. It was observed that *Bacillus* spp., an opportunistic pathogen commonly found in normal skin flora, grew in the culture of joint fluid from both knees.

CONCLUSION

The case of bilateral knee septic arthritis is rarely encountered in the literature. Opportunistic pathogens found in the normal flora should be kept in mind in patients who are immunosuppressed for any reason. In this context, it has not been encountered in the literature before, a case of *Bacillus* spp.causing such septic arthritis.

ETHICAL DECLARATIONS

Informed Consent: All patients signed and free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed. Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper and that they have approved the final version.

REFERENCES

1. Earwood JS, Walker TR, Sue GJC. Septic Arthritis: Diagnosis and Treatment. *Am Fam Physician*. 2021;104(6):589-597.
2. Mistry RM, Lennon D, Boyle MJ, et al. Septic arthritis and acute rheumatic fever in children: the diagnostic value of serological inflammatory markers. *J Pediatr Orthop*. 2015;35(3):318-322. doi:10.1097/BPO.0000000000000261

3. Minatogawa A, Ohara J, Horinishi Y, Sano C, Ohta R. Meningitis with staphylococcus aureus bacteremia in an older patient with nonspecific symptoms: a case report. *Cureus*. 2023;15(1):e34153. doi:10.7759/cureus.34153
4. Dryden MS, Kramer JM. Toxigenic Bacillus cereus as a cause of wound infections in the tropics. *J Infect*. 1987;15(3):207-212. doi:10.1016/S0163-4453(87)92553-9
5. Tusgul S, Prod'hom G, Senn L, Meuli R, Bochud PY, Giulieri SG. Bacillus cereus bacteraemia: comparison between haematologic and nonhaematologic patients. *New Microbes New Infect*. 2017;15:65-71. doi:10.1016/j.nmni.2016.11.011
6. Cohen E, Katz T, Rahamim E, et al. Septic arthritis in children: updated epidemiologic, microbiologic, clinical and therapeutic correlations. *Pediatr Neonatol*. 2020;61(3):325-330. doi:10.1016/j.pedneo.2020.02.006
7. Pääkkönen M. Septic arthritis in children: diagnosis and treatment. *Pediat Health Med Therapeut*. 2017:65-68. doi:10.2147/PHMT.S115429
8. Holzmeister A, Frazzetta J, Yuan FFN, et al. Evaluation for septic arthritis of the native adult knee is aided by multivariable assessment. *Am J Emerg Med*. 2021;46:614-618. doi:10.1016/j.ajem.2020.11.048
9. McGillicuddy DC, Shah KH, Friedberg RP, Nathanson LA, Edlow JA. How sensitive is the synovial fluid white blood cell count in diagnosing septic arthritis? *Am J Emerg Med*. 2007;25(7):749-752. doi:10.1016/j.ajem.2006.12.001
10. Wang DA, Tambyah PA. Septic arthritis in immunocompetent and immunosuppressed hosts. *Best Pract Res Clin Rheumatol*. 2015;29(2):275-289. doi:10.1016/j.berh.2015.05.008
11. Glassman I, Nguyen KH, Booth M, Minasyan M, Cappadona A, Venketaraman V. Atypical staphylococcal septic arthritis in a native hip: a case report and review. *Pathog Basel Switz*. 2023;12(3):408. doi:10.3390/pathogens12030408
12. Roy M, Roy AK, Ahmad S. Septic arthritis of knee joint due to parvimonas micra. *BMJ Case Rep*. 2017;2017:bcr-2017 doi:10.1136/bcr-2017-221926
13. Elsissy JG, Liu JN, Wilton PJ, Nwachuku I, Gowd AK, Amin NH. Bacterial septic arthritis of the adult native knee joint: a review. *JBJS Rev*. 2020;8(1):e0059. doi:10.2106/JBJS.RVW.19.00059
14. Frank FA, Peduzzi N, Brugger R, Morgenstern M, Cadosch D, Clauss M. Die septische arthritis. *Ther Umsch*. 2023;80(1):39-44. doi:10.1024/0040-5930/a001405
15. Goodsell S, Lewis A, Domanski K. Bilateral knee septic arthritis after prostatic urethral lift: a case report. *J Orthop Case Rep*. 2023;13(3):68-71. doi:10.13107/jocr.2023.v13.i03.3588